Networking Business Line
FISCAL YEAR 2008 – 2012 PLAN

Executive Summary

This Business Plan describes the services, organization, planning, and objectives of the Networking Business Line in the Department of Energy's (DOE) Working Capital Fund (WCF). The Networking Business Line consists of three enterprise activities: (I) Headquarter's Network Infrastructure, (II) Wide Area Network (DOEnet) Infrastructure (Department-wide) (III) Desktop support limited to Anti-Virus/Decontamination Services.

This plan is organized according to Balanced Scorecard (BSC) planning concepts and builds upon the trends and lessons learned during the WCF's first years of operation, and previous assistance from an Information Technology (IT) planning consultant, to meet DOE and the Office of the Chief Information Officer (OCIO) strategic goals and the objectives of each business line. It describes performance objectives and plans aimed at better meeting the current and anticipated out-year requirements of our customers over the life of this Plan.

The operational costs and capital investment impact of this plan are described in the **Economic Analysis section** on page 9.

Mission:
Information Technology is a key supporting element in accomplishing DOE goals. As such, it must be acquired, managed, and used in a way that maximizes its efficiency and effectiveness in supporting missions. The mission of the Networking business line is to provide timely, reliable, and enabling services to DOE HQ organizations located at the various Washington D.C. metropolitan locations and DOE-wide via the Department's wide area network.

Vision:
Provide cost-effective state-of-the-art networking services that support the DOE missions, meet DOE customers needs, and exceeds their expectations.

Defining Success:
Network services are a critical element in the ability of all DOE organizations to successfully carry out their missions. The Headquarter's network services organization success is measured by our ability to define and provide user service requirements in a time frame that meets their needs and maintain a reliable service to meet those needs. Network performance statistics provide the key measure of the success of the networking services group.

FY 2007 Accomplishments by Business Line Activity:

Summary Performance vs. Objectives

Business Line	SLA Objective Availability	Attainment
HQ Network Infrastructure	**99.5% (Per Task Order)**	**99.96%**
Internet Service	**99.0% (Per Task Order)**	**99.99%**
DOEnet Circuits	**99.5% (Per FTS2001)**	**99.95%**

Accomplishments:

Network Management Accomplishments

- Daily, Weekly and Monthly Headquarters Network Performance Reports are produced in support of all networking services. Tivoli NetView and Concord's E-Health are used to collect and report the network statistics. These reports are generated and serve as support for SLA documentation.
- Network Operations monitored all OCIO maintained Network Devices and Network Services, 24 hours/day X 7 days a week.
- Ongoing management of the DOE HQ Site Network and DOE Wide Area Network in accordance with established configuration management practices to provide a reliable operational environment and to avoid adversely affecting the operation and security controls for all authorized, connected production information systems.
- Completed all documentation requirements in support of the Network Certification & Accreditation (C&A).
- Generated an updated system inventory for all network devices managed by OCIO and developed a process to proactively manage/troubleshoot and schedule these devices for IOS and CatOS upgrades to the latest available version critical to the efficient management of the network.

Network Infrastructure Accomplishments

- Successfully provided network project planning and implementation activities to support the relocation of program offices for all planned phases of the Department's Sprinkler Project to include customer requirements, configuration design and implementation activities, and ongoing customer support.
- Supported DOE participation in Exercise Pinnacle, the White House sponsored 2007 COOP Exercise, successfully testing the agency's ability to coordinate, develop and implement continuity of staff to alternate operating facilities in the event of an emergency in Washington D.C.
- Supported the AHE annual disaster recovery (DR) exercises where the network and security teams jointly provisioned a site-to-site VPN tunnel using the VPN 3030 concentrator and an ASA 5510 firewall to allow connectivity between the SunGard recovery center in New Jersey and DOE HQ.
- The network team supported the EE program office product evaluation for Tandberg high definition video conferencing capabilities between DOE HQ and multiple field sites.
- Migrated DHCP services from a single Windows 2003 server to the high-availability Infoblox ID-Grid appliances.
- Modified the remote access ASA appliances' configurations to become a load-balanced cluster, increasing the availability of VPN remote access services.

DOEnet (WAN) Accomplishments

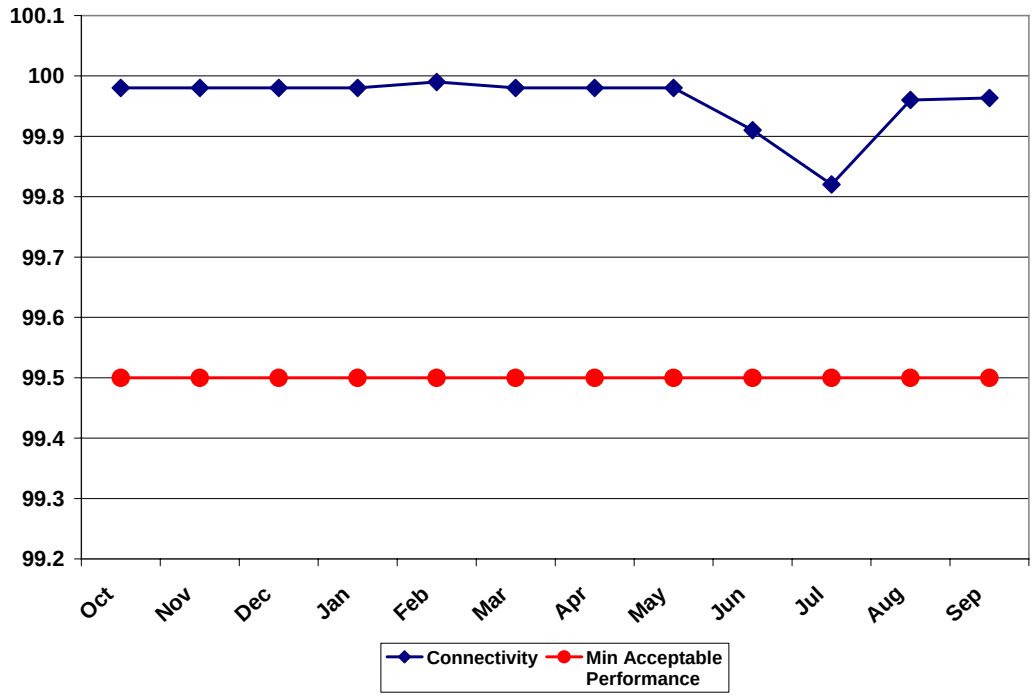
- Successfully completed installation of the ASA firewalls and intrusion prevention systems on all active DOEnet (WAN) nodes. Immediate benefits:
  - detailed traffic session logging,
  - protocol-level traffic enforcement,

  - stateful packet inspection, and
  - improved remote network management - both in-band and out-of-band.
- Established new full network connections for the Energy Training Services (Albuquerque, NM), and the Office of Legacy Management (Morgantown, WV); and, dedicated network connections on existing DOEnet nodes for the Y12 Site Office (Oak Ridge, TN) and the WIPP Waste Transportation tracking System replication site (Idaho Falls, ID), providing other network service and technical support.

Anti-Virus and Decontamination Services Accomplishments:

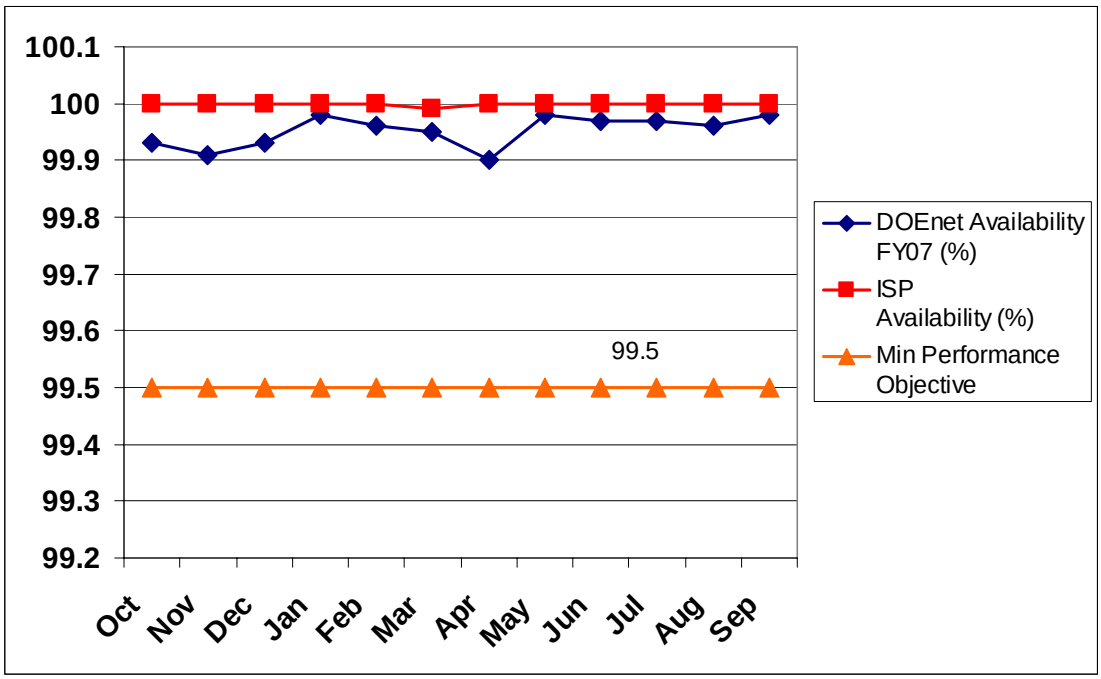
- 82,280 virus encounters, including 42 incidents, were addressed.
- 34 decontamination incidents involving 114 systems were addressed.
- 6,556 systems, including 325 servers and 111 VPN users were managed with McAfee ePolicy Orchestrator (ePO) anti-virus architecture.
- McAfee HIPS was deployed to 6,000 workstations.

Monthly Performance Metrics for 2007 by Business Line:
DOEHQ Headquarters Backbone Network Connectivity:



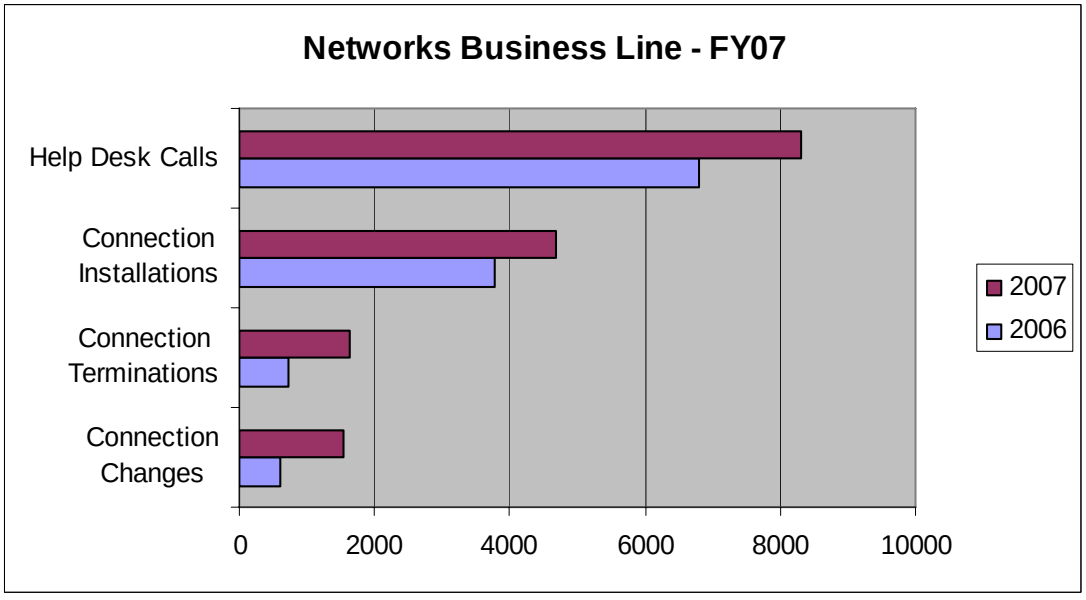
Network Connectivity is a measure of availability, latency, and reachability of all headquarters router and switch devices over time. Each device carries a weighted factor based on the number of end users supported relative to total users at Headquarters. We continue to refine our measurement capability and will, over time be able to provide more granular and customer specific data. Connectivity does not attempt to measure or consider anything other than network infrastructure devices (i.e. server and/or application availability are not in the calculation).

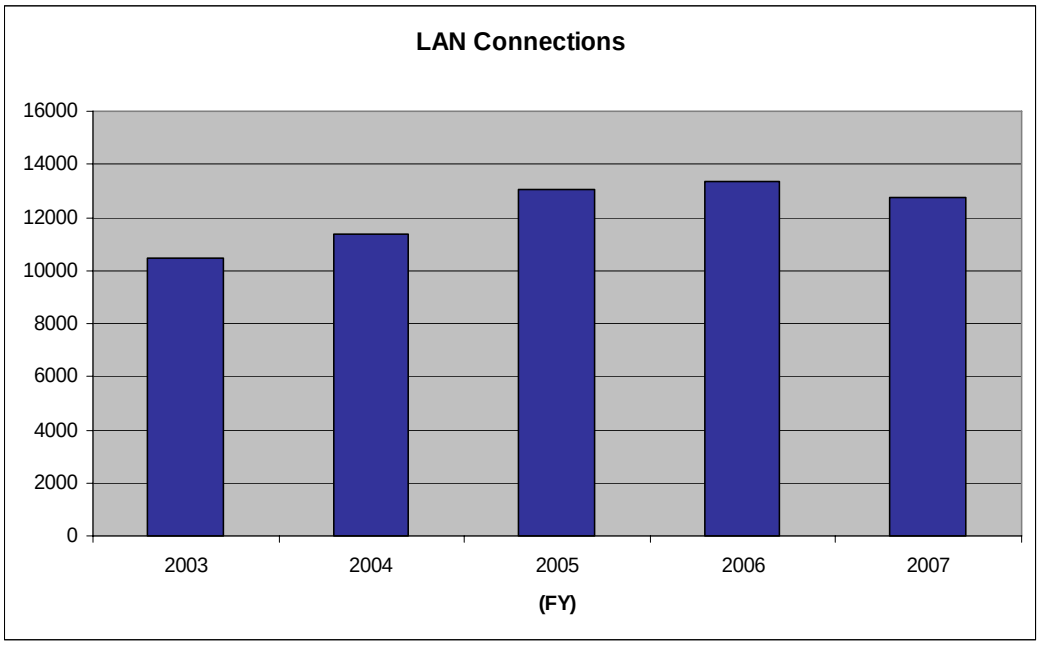
DOEnet Circuit & Internet Services Availability:



Enterprise Service Center Network Operations/Help Desk Support:
Customer satisfaction is measured by: personal contact with critical customers, help desk feedback on completed trouble tickets, and by direct feedback from users in the form of complaints. Customer satisfaction, measured by these methods, is judged to be very high.

During FY 2007, the Network business line staff responded to the following service calls with a noted increase in service calls from the previous Fiscal year:





Network connections reflected a slight decline in program office connections as a result of comprehensive inventory audits and 24/7 monitoring of all connections. Conversely, implementation of various e-government initiatives within DOE resulted in a significant number of new connections for file servers, web servers and other devices in support of e-government. The increase in help desk calls is a result of a continuing effort to capture all support activities in a help desk ticket.

The number of VPN users has continued to grow over the past year. The ESC Network Operations supported in excess of 5000 tickets during the fiscal year directly related to remote access services.

FY 2008 Goals by Business Line Activity:

- Meet/Exceed all business line service level agreement goals.
- Deliver network performance reporting on a timely basis.
- Effectively provide network monitoring and operations 24 hours/day X 7 days a week.
- Manage the networks in accordance with established configuration management practices.
- Address new network requirements in a cost effective, efficient manner.
- Deliver VPN services where practical to support customer requirements.
- Complete DOEnet transition to Networx from FTS2001.
- Deliver virus protection and decontamination services to meet the growing demand.
- Begin network upgrade/refresh project. (See Network Initiatives Section)

Business Case:

Background

This business line provides network connectivity service for approximately 8,000 users in the Department's Headquarters facilities in Washington, D.C. and in Germantown, Maryland,

enabling 100+ organizational LAN segments to interoperate across the MAN which spans 13+ offices in the Washington D.C. metropolitan area. In addition, the LAN interfaces with the Department's WAN providing service and communications links to 40 + field sites, other government agencies and public/private business partners.

The business line also provides Internet connectivity for a majority of DOE HQ customers in addition to six DOEnet sites.

The business line includes services such as:

- Hardware and software maintenance for all network infrastructure components
- Installation and management of the Network circuits connecting the DOE "campus" facilities
- Installations, moves, and changes of Network connection and infrastructure components
- Domain Name Service (DNS) management and maintenance
- Technical personnel to install, manage, and maintain the network infrastructure
- Virtual Private Network (VPN) Services

The WCF Board voted May 17, 2007, to merge the Desktop/Anti-virus Protection & Decontamination Services with the Network Business. This change was caused by the inception of eXCITE (DOE Common Operating Environment) desktop services by CIO Ops, which services include many of the activities previously financed by the Desktop business line. Also the Board approved the use of the same billing methodology for charging the remaining desktop activities as are currently used by the Network business.

Introduction

The purpose of the Networking Business Lines Plan is to provide the guidelines through which the OCIO WCF services are selected, planned, executed, and measured in support of IM-651's (formerly IM-60) business. The business of IM-651 is to provide a secure, reliable IT infrastructure and other core IT services to the DOE HQ facilities, the business functions within it, and DOE wide (for DOEnet).

IM-651 has established the following goals & objectives to improve the planning and delivery of WCF IT services to its customers:

- Create and maintain a clear networking line Business Plan.
- Enable the Department's IT business vision through the effective use of these IT services, which increases the customer's efficiency and effectiveness.
- Become a better business partner with the user community.
- Provide a continuously stable networking infrastructure environment that meets the needs of DOE end-users.
- Make the necessary information available to the DOE HQ's end-user community to enable them to clearly understand IT operations.
- Develop an IT organization that can focus on these "core" service areas (i.e., competencies) needed to support the DOE HQ's business; outsource some or all of these functions, where appropriate.
- Provide visibility to IM-651 efforts towards streamlining IT operations.

Business Line management reviews business goals and results through communication with

customers, vendors, and contractors. An active employee training policy is pursued subject to the limited funding available for training, in addition to constant self-assessment and benchmarking, in order to keep the organization current on industry changes and out-year directions.

Planning Process: Objectives for improving business line performance are in line with those of the President's Management Agenda e-Government the OCIO, the Deputy Secretary, the WCF, and support the Department's strategic objectives in Corporate Management. OCIO objectives are to use Information Technology to improve DOE mission accomplishment providing DOE WCF customers with current technology services and products at a fair cost to ensure customers receive value and quality services. The WCF objectives are to improve the efficiency of DOE's operations by having the cost of those services reflected in day-to-day decision making by program managers and to provide accurate full-cost budgets. The business line reports its progress towards these balanced scorecard objectives to the WCF Fund Manager on a quarterly and annual basis. These objectives and the performance goals and strategies are updated at appropriate times.

Current pricing policies have been implemented that are consistent with and based on the guidelines provided in the Working Capital Fund Guide to Services and Procedures 2008 (the Blue Book).

External regulation and partnerships: Partnership relationships are formed with various contractors to help provide these services to the customers. Enforceable service level agreements are developed that apply to these partnerships in order to promote continuous improvement in the delivery of services to our customers. Through the DOE Information Technology Conference (ITC), DOE Computer Security Conference, and DOE Records Management Conference, the OCIO establishes and maintains relationships with DOE Field and Laboratory end users and customers as well as colleagues in other government agencies and private sector businesses. Additionally, the Department's Chief Information Officer is actively involved with the Federal CIO Council, the principal interagency forum to improve agency practices for the management of information technology. We look to our partners and colleagues for information on emerging trends in customer service and technology and for best practices that we can adapt to our provisioning of information technology services. The Network Operations engineers, service providers, equipment and supply vendors support DOE's IT Operations by providing quality products and services. They also work to keep us informed of new technologies and practices that may benefit our customers.

Resources and capabilities of the organization: Federal and contractor staffs have extensive experience in providing networking services. Our line support staff assists customers in the selection of appropriate, cost effective equipment or services by performing an assessment or as necessary a requirements analysis in support networking capabilities.

Needs and capabilities of customers: Assistance and coordination is provided to our customers on several levels – with the overall program organizations senior management, with the program office CIO's and with the individual staff.

Economic Analysis

Business Line Trends

This business line provides network connectivity service supporting approximately 8,000 users with more than 16,000 network connections. It has upgraded and modernized the network infrastructure to respond to growing customer requirements. The growth of technology, particularly IP-based services (including voice and video), will continue for the foreseeable future. This growth will demand that the network services provided to our customers become more sophisticated, robust and flexible. The Enterprise Service Center Network Operations Team is prepared to meet that challenge with adequate network infrastructure cost recovery rates. That being said delivery of network services is not a one time investment. Refresh of network hardware should be provided for over the life of the service in order to provide a sustainable, robust network infrastructure.

Demand for VPN services, both in the form of point-to-point and client services, continues to grow. Support requirements is evident in the number of Help Desk (Applix) tickets addressed over time.

Workload requirements for the Virus Protection Plan are increasing due to escalated emphasis on cyber security, increased usage of various desktop and server protection tools, and increased targeted attacks by hackers and external elements. Events over the past year have required increased forensics and response capabilities, requiring expanded expertise. Cyber security attacks are expected to increase in volume and sophistication. In return, additional tools and resources will be put in place, requiring monitoring, analysis, and incident response. In addition, with continued consolidation of host-based cyber security under, the number of managed systems is increasing and will continue to increase, with an associated elevation in the number of actionable alerts, responses, and incidents. As of 10/1/07, NNSA ceased performing its internal decontaminations. Since NA historically has accounted for 70% of contaminations, this shifted significant requirements to the Virus Protection Program, increasing resource needs.

Financial Analysis

DOE's OCIO recognized a number of years ago (and validated by industry trends) the most effective means of providing a robust network infrastructure both within DOE Headquarters and agency wide was to move to a centrally managed, standards based approach. Standardizing hardware platforms would result in support cost efficiencies. A centrally managed approach would also result in a reduction in the number of help desks across program offices.

Successful accomplishment of DOE's corporate business practices is dependent on its network infrastructure. These business practices demand the timely delivery of data, whether it is financial, programmatic, or human resource related, if DOE is to be successful in supporting those practices. To that end ESC Network Operations meets with its service providers on a regular basis to review network performance and ensure that service level agreements are met.

Inputs to the Networks business line are contract personnel supporting day-to-day operations of

its network systems, network hardware and miscellaneous supplies, and leased carrier circuits that serve as the backbone for network services. Federal program management oversee the effectiveness of the business line.

For the most part, the costs associated with the business line are fixed costs. The trend in carrier leased circuit costs has continued to decrease over time. Leased circuit costs are negotiated rates established by the General Services Administration.

Task/Vendor	FY08	FY09	FY10	FY11	FY12
Network Expenses					
Network Infrastructure	2,533,500.00	3,267,100.00	3,364,900.00	3,465,000.00	3,494,100.00
Network ODC	977,500.00	977,500.00	977,500.00	977,500.00	977,500.00
Sonet Ring	960,000.00	960,000.00	960,000.00	960,000.00	960,000.00
Total Network Expenses	4,471,000.00	5,204,600.00	5,302,400.00	5,402,500.00	5,431,600.00
DOEnet Expenses					
DOEnet Labor	1,537,000.00	1,554,000.00	1,572,000.00	1,590,000.00	1,610,000.00
DOEnet Upgrade ODC	70,000.00	70,000.00	70,000.00	70,000.00	70,000.00
Total DOEnet Expense	1,607,000.00	1,624,000.00	1,642,000.00	1,660,000.00	1,680,000.00
Desktop Expense	798,000.00	798,000.00	798,000.00	798,000.00	798,000.00
Total Network Business Line Expense	6,876,000.00	7,626,600.00	7,742,400.00	7,860,500.00	7,909,600.00

Balance Score Card

Balance Score Card Objectives:

- **Customers:** Improve customer service through the delivery of reliable effective network services
- **Financials:** Improve efficiency and ensure full cost recovery of ongoing daily costs as well as needed periodic capital improvements.
- **Internal Processes:** Apply best practices and industry standards in technology advancements.
- **Learning and Growth:** Enhance the effectiveness, knowledge, and satisfaction of the Lines' employees.

Customer Objective: *Improve customer service through the delivery of reliable effective network services.*

The most important need for individual customers is secure and reliable networking services. For example, our customers want to be able use the HQ Site Network and DOEnet to use e-mail services, access corporate data, access the Internet; and to have timely responses to related problems and performance issues.

Programmatic customers want these IT services that enable them to accomplish their mission at a reasonable price. Program organization managers make the tradeoff between service levels and related costs, where appropriate. By providing these WCF IT services, we help to promote efficient, effective, and economical operation of DOE HQ.

Performance Goal	Performance Standard
Measure Customer Satisfaction by surveys, or direct requests for input on specific services individuals received. Make changes where needed.	Achieve an overall customer satisfaction rating of 95% or higher each year.
Measure performance standards against established service level agreement objectives.	Apprize the DOE WCF Board at least annually of the status of ongoing efforts to achieve performance goals.

Baseline:

- Customer satisfaction is measured via surveys by conducting at a minimum an annual sampling of organizations the OCIO supports, discussion with Program Office CIO's, their staff, and others. Additionally, direct customer satisfaction is measure in follow-up to identified issues and related support. A customer services survey is currently in progress and will be shared upon completion.

- Network availability has consistently been above the defined goals as evidenced in the defined accomplishments. OCIO will continue to report these achieved performance goals annually the WCF Board.

- Communications are key to supporting customers nationwide. To that extent the OCIO strives to keep customers informed via quarterly video teleconferences, DOEnet "Alert" e-mails, and participation in annual conferences that promote customer face-to-face interactions.

DOEnet process elements are quarterly reviewed by the Office of the Associate CIO for IT Support Services to identify opportunities to make service improvements and maximize operating efficiencies. Two independent groups with broad customer representation, the IT Working Group (chartered by the WCF Executive Board) and the Associate CIO Council, exercise evaluation and advisory roles in partnership with CIO Business Line management and operating staff.

Strategies for Improving Customer Satisfaction	**Fiscal Year**				
	2008	**2009**	**2010**	**2011**	**2012**
Measure customer satisfaction	**x**	**x**	**x**	**x**	
Conduct business line self assessments	**x**	**x**	**x**	**x**	**x**
Continue partnering efforts through the IT Working Group and Assoc CIO Council	**x**	**x**	**x**	**x**	**x**

Financial Objective: *Improve efficiency and ensure full cost recovery of ongoing daily costs as well as needed periodic capital improvements.*

The Working Capital Fund has been successful in its goal of improving customer efficiencies that result from the consumption decisions of program offices. In order to continue providing our customers with competitively priced services, we will review our costs, especially fixed business costs. Fixed costs include depreciation, support contracts costs and the cost of contracts from commercial organizations for basic telephone and networking services that are only available from commercial sources. To help ensure that costs and charges are accurate and reasonable, we will periodically have these items reviewed by an outside independent and objective group and/or survey other government agencies for comparison of services and costs. Additionally, standardization and centralization of the shared enterprise wide distributed computing environment should also help to ensure reasonable costs and charges with the continued rollout of the DOE e-Gov initiatives. The costs will also continue to be monitored internally by IM as has been the case since the inception of the fund to help ensure continued value for our customers.

Performance Goal	**Performance Standard**
Review costs with the assistance of outside organizations with appropriate skills.	Charge customers appropriately for the services they receive.

Baseline: The OCIO has effectively delivered network services at a profit for several years by effectively managing network services costs. Transition of all telecommunications services from FTS 2001 to Networx will be completed during 2008. OCIO expects savings to be achieved once this transition has been completed.

- Costs have been reduced in some areas of the networking business line since the inception of the fund for this line.
- Data continues to be reviewed at least quarterly in association with the Quarterly Financial Reviews.

Strategies for reviewing costs	**Fiscal Year**				
	2008	**2009**	**2010**	**2011**	**2012**
Review costs with outside assistance		**x**			
Review costs with internal IM resources	**x**	**x**	**x**	**x**	**x**

Internal Process Objective: *Apply best practices and industry standards in technology advancements.*

The majority of effort for the network business line is building, maintaining, and sustaining a robust information technology infrastructure. A complete and scheduled discussion of a network upgrade plan is in development. The OCIO recognizes the importance of being forward looking when it comes to network technologies. A plan to upgrade the data network infrastructure is key to delivering reliable services.

The Networking Business Line is continuously developing its staff's ability to identify and solve problems affecting the business lines, and to create the most dynamic, efficient business possible. The greatest opportunity for learning and growth is achieved through periodic meetings between the Business Line Managers and their Federal and contracted staff. These staff meetings focus on eliminating operational barriers to the business line and produce many of the ideas for performing self-assessments. In addition to these meetings, informal meetings analyzing the business line occur on a regular basis and Federal staff generate periodic weekly reports highlighting important issues that may affect the business line as well as potential solutions.

When a significant or recurring problem is identified, a self assessment is first conducted against performance metrics in the problem area (e.g., number of help desk calls resolved by Tier 1 personnel). When the root cause(s) of the problem is identified efforts are initiated quickly to efficiently solve it. Tracking systems are utilized to track problems until they are solved, and summary reports are reviewed at least quarterly to help ensure that the same problem does not reoccur.

Performance Goal	**Performance Standard**
Address and minimize the impact of problems as quickly as possible.	Conduct periodic reviews and report results within OCIO or outside OCIO as appropriate.

Baseline:

- Problems have been resolved that are inherent to running this technology based lines, many of which are the latest software and hardware technology since the inception of these services being in the fund.

Learning and Growth Objective: *Enhance the effectiveness, knowledge, and satisfaction of the Lines' employees.*

The Networking business line is continuously developing its staff's ability to proactively identify and solve potential problems as well as current problems affecting the business line in order to achieve the highest possible levels of service to our customers. This learning and growth is accomplished with OJT as well as attendance at vendor symposiums and conferences as well as targeted specific training. In addition to these types of training and learning opportunities, weekly staff meetings as well as informal meetings fosters the exchange of knowledge such that all lines benefit.

Baseline:

- Business line staff continue to receive Project Management and COTR training to improve business line management.
- Other employees have received specific technical training targeted to their areas of responsibility.
- During FY 08 Network Operations staff will receive specific training to support implementation of IPv6 over the network.

Strategies for Improving Learning and Growth	**Fiscal Year**				
	2008	**2009**	**2010**	**2011**	**2012**
Continue to Re-evaluate Strategy	**x**	**x**	**x**	**x**	**x**
Continue to train 20% of employees	**x**	**x**	**x**	**x**	**x**

Business Line Initiatives:

The Network business line is growing primarily due to new services offered to existing users. New services include desktop IP video conferencing that will be hosted over the network, i.e., the LAN; DHCP; improved Internet connectivity; VPN services and upgrading existing hardware to permit faster throughput for network users. A five-year plan for the convergence of data, voice, and possibly video networks is being developed as a coordinated effort between the Network and Telephone Business Lines.

The business will continue to evaluate the cost of DOEnet and other services and when warranted reduce costs of service or increase the level of service to meet changes in customer needs and to implement appropriate new technology.

The business line manager will strive to keep the business line services in line with current technology to ensure customers are receiving the best possible service. With the current speed of

information technology advancements, it is difficult to accurately predict what is needed in the out years. The initiatives listed below are recommended changes to support known requirements.

These planned activities are necessary to sustain a networking infrastructure that is consistent with the business needs of the Department. Additionally, they address capabilities driven by e-Government Legislation, life-cycle maintenance (technology refreshment), convergence management, cyber-security requirements, and continuity of operations expectations.

FY 2008

Refresh: Technology refresh/upgrade for the network edge (primarily closet switches). Legacy (non-Cisco, non-VLAN, and/or non-802.1x capable) closet switches will be replaced with switches that provide at least 100 Mbps to the end-user, Gigabit uplinks, support for 802.1Q VLAN configurations and 802.1x authentication. The baseline standard closet switch for all new deployments is the Cisco Catalyst 3560 for individual deployments and the Catalyst 3750 for stacking deployments, both capable of delivering advanced enterprise edge services and Power over Ethernet in preparation for VoIP.

C&A Baselines: Continue to maintain the certification and accreditation of the DOE networks operated by the OCIO. New baseline configuration templates will be used to ensure that all network infrastructure devices are configured using approved standards and security controls are enforced.

802.11 Pilot: Establish an 802.11 wireless network capability at DOE HQ to support conference rooms and limited user mobility within OCIO-managed space. Wireless connectivity in conference rooms and other areas will be provided to allow mobile users to access the Internet and DOE Remote Access services (e.g. VPN and Citrix) without compromising the cyber security of the HQ Site Network.

DR DNS: Deploy two additional DNS servers at DOE HQ in support of DR/COOP exercises conducted by the OCIO Application Hosting Environment. Execute DNS changes and operate separate zones as needed for DR and COOP activities in support of corporate applications brought online at the Sunguard facility.

IPv6: IPv6 network configurations and addressing will be deployed for systems attached to the HQ Site Network and DOEnet WAN as needed to meet OMB requirements.

FY 2009

Refresh: Technology refresh/upgrade for the network edge (primarily closet switches). Legacy (non-Cisco, non-VLAN, and/or non-802.1x capable) closet switches will be replaced with switches that provide at least 100 Mbps to the end-user, Gigabit uplinks, support for 802.1Q VLAN configurations and 802.1x authentication. The baseline standard closet switch for all new deployments is the Cisco Catalyst 3560 for individual deployments and the Catalyst 3750 for stacking deployments, both capable of delivering advanced enterprise edge services and Power over Ethernet in preparation for VoIP.

802.11 Guest Net & 802.1x Guest Net: Deploy guest and mobile user network access throughout selected areas of DOE HQ buildings through the use of 802.11 and 802.1x technologies. Provide wireless connectivity in conference rooms and other areas where guests and mobile users will benefit from Internet access but are not permitted direct access to the internal HQ Site Network. 802.1x authentication and FIPS 140-2 encryption will be used to ensure only authorized users are permitted access. Additionally, 802.1x will allow conference rooms and other shared spaces to provide wired access to mobile users through the use of Guest VLAN capabilities.

MAN IPSEC: Upgrade the Germantown and Forrestal Metropolitan Area Network routers and the downstream site office routers to enable AES-256 encryption and compression across all data circuits that interconnect DOE HQ buildings.

WAN Traffic Inspection: Enable Netflow traffic accounting and additional firewall and intrusion prevention services on all DOEnet site routers and ASA appliances. Expand the firewall and traffic inspection rule sets to further lockdown the environment. Deploy Cisco MARS at DOE HQ to analyze events from the routers and firewalls on the WAN.

VoIP Broad Pilot: Expand the Voice-over-IP pilot with additional users throughout DOE HQ and begin to deploy Video-over-IP services with the initial deployment of an OCIO-managed IP video bridge and ISDN gateway in continued preparation for a converged network.

FY 2010-12

Refresh: Technology refresh/upgrades for the network edge and distribution layers. Cisco Catalyst 6500 distribution and data center switches will be upgraded with new supervisor engines to raise backplane capacity from 32 Gbps to 720 Gbps and 1.44 Tbps; 100 Mbps line cards will be replaced with Gigabit line cards. Edge switches will be upgraded to support Gigabit and multi-Gigabit uplinks.

Unified Wired/Wireless: Wireless and wired network access at DOE HQ will be unified to allow end-users to access HQ Site Network internal resources without VPN through both wired and wireless connections. Wireless service modules will be installed in distribution switches to control 802.11 access points in selected areas at DOE HQ to allow authorized mobile users (e.g. laptops) to roam across a unified wired and wireless network using AES-256 encryption and strong authentication when wireless.

10 Gigabit Core & MPLS: Upgrade all core switch interconnections at Germantown and Forrestal from Gigabit Ethernet to 10-Gigabit Ethernet. Upgrade the SONET ring between Germantown and Forrestal to support multi-Gigabit capacity. Deploying additional bandwidth, quality-of-service capabilities, security features and advanced technologies such as MPLS, and new traffic management features will ensure the network can meet increased demands and simplifies the architecture to minimize the number of provisioning changes required to build out end-to-end services.

Desktop Video: Enable multicast networking throughout the HQ Site Network and provision access between desktop VLAN segments to allow site-wide edge-to-edge IP video conferencing and IP TV services.

Gig to the Desktop: Deliver Gigabit Ethernet network connectivity to the desktop for increased bandwidth enabling advanced applications on top of voice and video over IP convergence across a single network infrastructure.

Active/Active COOP: Complete all requirements to fully enable and support off-site DR/COOP requirements. Deploy load-balancing appliances configured in an active/active state where services can be operated simultaneously at both DOE HQ and at one or more off-site DR/COOP facilities (e.g. Sunguard, ESC-West, etc.).